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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,183	03/12/2007	Maurice Morency	2003390-0031	8998

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EXAMINER	
TAKEUCHI, YOSHITOSHI	

ART UNIT	PAPER NUMBER
4162	

NOTIFICATION DATE	DELIVERY MODE
09/17/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@choate.com

Office Action Summary	Application No.	Applicant(s)	
	10/583,183	MORENCY ET AL.	
	Examiner	Art Unit	
	YOSHITOSHI TAKEUCHI	4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2006* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *15 Feb 2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Objections

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

2. Claims 13 and 19 are objected to because of the following informalities: decimal points should use proper American notations for numbers. The application currently uses a comma, rather than a period, for a decimal point. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Regarding claims 12-15 and 19-20, the term "grade" renders the claim indefinite because it is unclear what is meant by the terms. In examining the application, the examiner broadly interpreted the limitation of "grade" to mean the pigment has a specific particle size range commonly used to describe pigments manufactured through hydrometallurgy. Proper clarification of the usage of the term "grade" is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-4, 7-10 and 16, are rejected under 35 U.S.C. 103(a) as being obvious over an article by Jebrak et al. (Michel Jebrak, Maurice Morency & Denise Fontaine, Characterization of Steel Dust from the Sorel-Tracy Region and Technologies for their Treatment, Centre de Recherche en Environnement (1993)). Jebrak teaches a hydrometallurgical process (page i, paragraph 8) for the treatment of steel mill arc furnace dust (page i, paragraph 1) containing agglomerates of small ferrite particles and larger magnetite particles (page i, paragraph 7

discloses micron-sized ferrite and magnetite particles. Bulk particles are present in a range of sizes, while the exact population of particle sizes differs depending on the means of production, it is inherent that when two populations of particles are of the same order of size, that some particles of one population will be larger than the particles of the other particle population), the ferrite particles coating by adsorption the larger magnetite particles (an inherent characteristic of ferrite particles and magnetite particles is that when the ferrite particles are in close proximity of the magnetite particles, the ferrite particles will tend to be adsorbed to the magnetite particles), the dust further containing lime (which is composed of calcium oxide) and lead (page i, paragraph four, where applicant admits that electric arc furnace dust contains dangerous levels of soluble lead (page one, paragraph 2), and Stephens teaches a method of processing still mill arc furnaces (page i, paragraph 1)), together with minor elements selected from the group consisting of Cd and chlorides (page i , paragraph five). The Jebrak process comprises the steps of: (**a**) washing the arc furnace dust in water (Figure 8.2, where the powder is washed in a wet drum), said washing step being performed under agitation (washing is agitation, page 13, paragraph 6 and with an alkaline pH (page 13, paragraph 6); (**b**) decanting the solution of step (a) (filtering implies pouring liquid from one container to another container, Figure 8.4); (**c**) separating the slurry and the supernatant liquid (Figure 8.4, where filtering implies separating the slurry and supernatant liquid); and (**e**) treating the slurry from step (d) to produce pigments selected from the group consisting of ferrite pigments, magnetite pigments and ferrite/magnetite pigments (page 33, paragraph 6, which describes making steel dust, composed of ferrite and magnetite—compositions with inherently vibrant colors, available to the pigment and paint industries).

Jebrak does not teach using an anionic surfactant on the slurry obtained in step (c), however, Jebrak suggests adding a deflocculant (page 3, paragraph 7) and an appropriate dispersant (page 33, paragraph 8) as a means of improving the separation of magnetite and ferrite particles. As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to add an anionic surfactant to the slurry, since anionic surfactants are well-known to improve the separability of particles.

Regarding claim **2**, Jebrak teaches the possibility of combining successive treatments. (Page 3, paragraph 6).

Regarding claims **3** and **4**, Jebrak teaches the use of an appropriate dispersant (page 33, paragraph 8) and separating different mineral phases after neutralization of the charge effect at the particles[']surface (page 1, paragraph 5). By neutralizing the charge effects of the particles, the zeta potential (the degree of repulsion between adjacent, similarly charged particles) is reduced to zero, which is the isoelectric point (the point where molecules carries no net electric charge).

Regarding claim **7**, **10** and **16**, Jebrak teaches magnetically separating the slurry into a first fraction composed essentially of ferrite, which intrinsically has brown coloring, and a second fraction composed essentially of magnetite, which intrinsically has a black coloration, the first fraction being less magnetic than the second fraction. (Figure 8.2 and page 13, paragraph 7, Magnetic separation of ferrite from magnetite, where pigment is understood to be a substance capable of being used for adding a characteristic color, such as brown or black).

Regarding claim **8** and **9**, Jebrak teaches the use of a magnetic field using 1,000 gauss, but does not teach the use of an electric field in the range of 400 to 700 gauss. However, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to use a magnetic field in the range of 400 to 700 gauss, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

9. Claims **5** and **6** are rejected under 35 U.S.C. 103(a) as being obvious over Jebrak et al. (Michel Jebrak, Maurice Morency & Denise Fontaine, Characterization of Steel Dust from the Sorel-Tracy Region and Technologies for their Treatment, Centre de Recherche en Environnement (1993)), in view of Itoh et al. (F. Itoh, M. Satou and Y. Yamazaki, Anomalous Increase Of Coercivity In Iron Oxide Powder Coated With Sodium Polyphosphate, Vol. MAG-13, No. 5, IEEE Transactions on Magnetics, p.1385 (1977)). Jebrak teaches a hydrometallurgy process for separating magnetite and ferrite particles, but does not teach the process with sodium metaphosphate.

The Itoh article teaches an anomalous increased coercivity and decreased magnetization in inverse proportion to the coercivity of a non-stoichiometric iron oxide powder coated with sodium metaphosphate and heated at 100-300°C. The coercivity and magnetization of the treated iron oxides returned to the original value or to less than the value of untreated iron oxides by washing with water to remove the sodium metaphosphate. It was assumed by the paper that an origin of the increase in the coercivity is due to a surface anisotropy caused by a coupling force,

which was induced in the interface between the particle surface of the iron oxide and the absorbed phosphorous molecule. (Introduction).

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to add sodium metaphosphate to the hydrometallurgy process taught by Jebrak as a surfactant in order to keep the particles separated, since sodium metaphosphate is known to reduce the magnetic attraction between iron oxide particles, and the Jebrak process taught the use of a deflocculant in order to ease the magnetic separation of particles.

10. Claims 11-15 and 17-21 are rejected under 35 U.S.C. 103(a) as being obvious over Jebrak et al. (Michel Jebrak, Maurice Morency & Denise Fontaine, Characterization of Steel Dust from the Sorel-Tracy Region and Technologies for their Treatment, Centre de Recherche en Environnement (1993)), in view of Hitzrot, Jr. (US 4,190,422) (Hereafter the "'422 patent"). Jebrak teaches a hydrometallurgy process for separating magnetite and ferrite particles. (Abstract). However Jebrak does not teach an initial screening followed by wet grinding and then a succession of multiple screenings to grade the particles by size. However, the '422 patent teaches a method of preparing steel mill waste product via an initial screening, wet grinding, and a plurality of subsequent screenings to grade the particles into a plurality of sizes. (Abstract and Figure 1).

Regarding claim **11**, Jebrak teaches treating particles with a solvent, to obtain a leached slurry (Figure 8.4) and filtering said leached slurry into a solid fraction (Figure 8.4, "dry filtrate") that contains ferrite pigments (pigments from page 21, paragraph 4) and a liquid fraction (Figure 8.4, "filtering liquid"). Jebrak does not teach removing

particles having a grain size of 20 um or more or drying said solid fraction. However, the '422 patent teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated, and the '422 patent also teaches drying the particles after wet grinding. (Abstract and Figure 1).

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind and then dry the ferrite and magnetite particles in order to prepare them for further sieving, since the '422 patent teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade.

Absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size of 20 um or more, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Regarding claim **12**, Jebrak teaches water as a solvent with ferrite pigments. However Jebrak does not teach the use of ferrite pigments that are of a first grade. However, the '422 patent teaches sieving the dried particles multiple times to create batches of particles with discrete particle sizes. As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a first grade specification.

Regarding claim **13**, Jebrak teaches the use of 12 M sulfuric acid, which has a pH of -1.08, as a solvent in acid leaching (Figure 8.3) but does not teach ferrite pigments that

are of a second grade. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a second grade specification.

In addition, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to perform leaching at a pH of 0.5 to 3.0, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Regarding claim **14**, Jebrak teaches the use of 12 M nitric acid, which has a pH of -1.08, as a solvent in acid leaching (Figure 8.3), but does not teach ferrite pigments that are of a third grade. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to create a batch of ferrite particles after wet grinding and sieving in order to create a batch of particles with particle sizes that would satisfy a third grade specification.

Regarding claim **15**, the '422 patent teaches wet grinding to a finer mean grain size, which after magnetic separation would inherently lead to a ferrite population with a lower concentration of lead. As a result, it would have been obvious to a person of ordinary skill at the time of the invention to wet grind the particles in order to prepare ferrite particles with particle sizes that would satisfy the fourth grade specification.

Regarding claim **17**, Jebrak does not teach separating particles having a grain size larger than 6 um those having a grain size less than 6 um. However, the '422 patent

teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated. (Abstract and Figure 1).

Absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to separate particles having a grain size larger than 6 um from those with a grain size less than 6 um, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Regarding claim **18**, Jebrak teaches filtering (Figure 8.4) and providing for successive treatments (page 3, paragraph 6). The '422 patent teaches reprocessing particles that are to coarse and fine by sending them back to the mill for processing. (Abstract and Figure 1).

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to screen particles too fine back to the mill in the Jebrak process since the fines can be used to recover iron, and this avoids the expense of disposing of the hazardous waste product.

Absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to remove particles having a grain size greater than 40 um or more and a grain size of 6 um or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Also, it would have been obvious to a person of ordinary skill at the time of the invention to send the coarse particles back for further wet grinding, rather than to the mill, since where the particles have a marketable value, and is not merely a byproduct, the particles are the closes starting material to making the pigments.

Regarding claim **19**, Jebrak teaches filtering and drying (Figure 8.4) and separating out the magnetite (page i, paragraph 7 and page 1, paragraph 4, where magnetic separation separates the ferrite and magnetite particles) the '422 patent teaches wet grinding particles and screening prior to drying (abstract and Figure 1).

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind ferrite and magnetite particles to the order of 0.3 um grain size, since the '422 patent teaches that steel mill waste product can have useful commercial uses if the particles of specific sizes.

Also, absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size meeting the first grade specification, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Regarding claim **20**, Jebrak suggests using a colloidal washing to purify the particles (page 35, paragraph 1, the teaching of purifying the particles implies decanting the liquid, since the particles would not be purified until removed from the liquid), use of a deflocculant (page 3, paragraph 7), filtering, and drying the slurry (Figure 8.4). The '422 patent teaches wet grinding the particles.

As a result, it would have been obvious to a person of ordinary skill at the time of the invention to wet grind the particles, since the '422 patent teaches that steel mill waste product can have useful commercial uses if the particles of specific sizes.

Regarding claim **21**, Jebrak teaches treating particles with a solvent, to obtain a leached slurry with 12 M nitric acid (Figure 8.4) and filtering said leached slurry into a solid fraction (Figure 8.4, "dry filtrate") that contains ferrite and magnetite pigments (pigments from page 21, paragraph 4) and a liquid fraction (Figure 8.4, "filtering liquid." Jebrak does not teach removing particles having a grain size of 60 um or less or drying said solid fraction. However, the '422 patent teaches sieving particles prior to wet grinding to ensure only particles of certain sizes will be treated, and the '422 patent also teaches drying the particles after wet grinding. (Abstract and Figure 1).

It would have been obvious to a person of ordinary skill at the time of the invention to wet grind and then dry the ferrite and magnetite particles in order to prepare them for further sieving, since the '422 patent teaches that steel mill waste product can have useful commercial uses if they are purified and separated by grade.

Absent a showing of unexpected results, it would have been obvious to one skilled in the art at the time of the invention to filter out particles having a grain size of 60 um or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. In re Aller, 220 F.2d 454 (CCPA 1955).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, includes Hitzrot, Jr. (4,432,803).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSHITOSHI TAKEUCHI whose telephone number is (571) 270-5828. The examiner can normally be reached on Monday-Thursday 9:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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